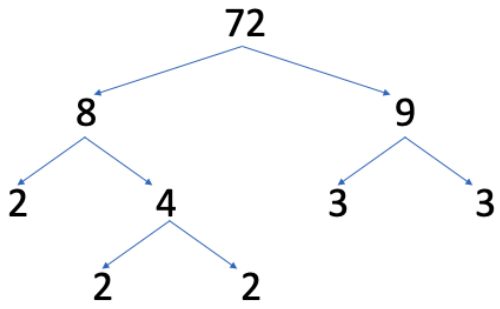
8. Lavanya

Program Name: Lavanya.java **Input File: lavanya.dat**

Lavanya just learned how to take the prime factorization of a number in her Algebra class. Recall, prime factorization is a way of expressing a number as a product of its prime factors. Remember, a prime number is a number that is divisible by 1 and itself only. For example, the prime factorization of 72 is: 2 * 2 * 2 * 3 * 3. A visual representation of this is:



In order to double check her homework problems, Lavanya has decided to write a program to tell her the prime factorization of any whole number. Can you help her write such a program?

Input: Input will begin with an integer T, the number of test cases. T will be in the range of [1,50]. The following T lines will each contain a single integer I. I will be in the range of [2,2147483647]

Output: For each integer I, you are to output: "`I = primefactor1 * primefactor2 * … * primefactorN`". There is one space between all numbers and operators. NOTE: in the output format, the prime factors are in ascending order, ie, smallest to largest. Your output must match this ascending order.

Sample input:

```
10
72
13
23
100
512
27
28
1000
1001
42
```

Sample output:

```
72 = 2 * 2 * 2 * 3 * 3
13 = 13
23 = 23
100 = 2 * 2 * 5 * 5
512 = 2 * 2 * 2 * 2 * 2 * 2 * 2 * 2 * 2
27 = 3 * 3 * 3
28 = 2 * 2 * 7
1000 = 2 * 2 * 2 * 5 * 5 * 5
1001 = 7 * 11 * 13
42 = 2 * 3 * 7
```